THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

MODIFIED BASE-LINE STUDY ON LINERBOARD

Project 1108-36

Report Three

A Progress Report

to

TECHNICAL DIVISION
FOURDRINIER KRAFT BOARD INSTITUTE, INC.

November 30, 1966

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Appleton, Wisconsin

MODIFIED BASE-LINE STUDY ON LINERBOARD

INTRODUCTION

The modified base-line study on linerboard is a trial program designed to study the feasibility of obtaining reliable profiles of quality for six major grades of linerboard from monthly averages of mill test data obtained routinely on linerboard manufactured on paper machines within the F K.B I membership.

The trial program, as approved by the Technical Division at their meeting on September 22, 1966, covers the period from April 1, 1966, to March 31, 1967 The preliminary report prepared at the Institute for the September 22nd meeting summarized data submitted for the months of April and May The members of the Technical Division agreed that this preliminary report was acceptable in format and, therefore, should be accepted officially as the first of the six bimonthly progress reports which will be prepared at the Institute during the twelve-month trial program

The trial program was outlined by a special subcommittee of the Technical Division They suggested that monthly averages of routine mill quality control data for moisture content, basis weight, caliper, and bursting strength should be reported for individual machines for each of the following six major grades of which at least 1000 tons were produced during a one-month period 26 lb , 33 lb 38 lb , 42 lb , 69 lb , and 90 lb The subcommittee also recommended that basis weight be reported in two ways (1) as reported, i.e , corresponding to the reported moisture content, and (2) adjusted to a moisture content of 7 8% The trial program described above was approved by the Technical Division and subsequently implemented by distribution of a data sheet for reporting the desired information to the Institute for compilation

The current report is a tabulation of data for the months of August and September. Data for the month of August are summarized in Tables I through VI, respectively, and for the month of September in Tables VII through XII, respectively, for the following six major grades of linerboard: 26, 33, 38, 42, 69, and 90 lb. August and September data for each of these six grades are presented graphically in the following figures:

Property	Figure Number	
	August	September
Moisture content	1	5
Adjusted basis weight	2	6
Caliper	3	7
Bursting strength	4	8

Data submitted by the participants relative to conditioning and testing environments are summarized in Table XIII.

TABLE I

AVERAGES FOR AUGUST, 1966, OF ROUTINE MILL QUALITY CONTROL DATA FOR 26-LB. FOURDRINIER KRAFT LINERBOARD

Machine code	A	F	H	J	N	O	R	T	V	Y	Z	CC	Cur. FKI Av.	Cum. FKI Av	FKI Index, %[a]
Reported moisture content, %															
Cur. machine av.	5 2	6.9	5.4	5.5	5.4	4.9	4 5	5.2	5.8	5.4	6.5	5.3	5 5	5.4	101.9
Cum. machine av.	5 6	6.6	5.1	5.5	5.3	4 9	4.7	5.4	5.6	5.4	5.4	4.9	--	--	--
Machine factor, %[b]	92.9	104.5	105.9	100.0	101.9	100.0	95.7	96.3	103.6	100.0	120.4	108.2	--	--	--
Machine index, %[c]	96.3	127.8	100 0	101 9	100 0	90.7	83.3	96.3	107.4	100 0	120.4	98 1	--	--	--
Reported basis weight, lb /M ft.^{2}															
Cur. machine av	27 1	26 8	26.4	26 9	26 1	26 1	26.2	27 0	26.2	26.5	26 4	26 8	26 5	26.7	99 3
Cum. machine av	26 8	26 8	26 6	26 5	26.2	26.0	26 2	26.9	26.3	26.7	26.7	27 0	--	--	--
Machine factor, %[b]	101.1	100.0	99.2	101.5	99 6	100.4	100 0	100.4	99 6	99.3	98.9	99 3	--	--	--
Machine index, %[c]	101.1	100.4	98 9	100 7	97 8	97 8	98 1	101 1	98 1	99.3	98 9	100.4	--	--	--
Adjusted basis weight, lb /M ft.^{2}[d]															
Cur. machine av	27 9	27.1	27.1	27 6	26 8	26.9	27.1	27.8	26.8	27.2	26 8	27.5	27 2	27.4	99.3
Cum. machine av.	27 4	27.2	27.4	27.2	27 0	26.8	27.2	27.6	26 9	27 4	27.4	27 9	--	--	--
Machine factor, %[b]	101.8	99.6	98 9	101.5	99 3	100.4	99 6	100.7	99.6	99.3	97.8	98.6	--	--	--
Machine index, %[c]	101.8	98 9	98 9	100.7	97 8	98.2	98.9	101.5	97.8	99 3	97.3	100.4	--	--	--
Reported caliper, pt															
Cur. machine av.	8.9	7.8	6.6	7 8	7.3	9.1	7.3	8.8	8.2	7.7	9.0	7 6	8.0	8.1	98.8
Cum. machine av.	8.6	7 7	6 9	7.5	7 5	8.3	7.8	8 8	7.7	7.9	9.1	7 4	--	--	--
Machine factor, %[b]	103.5	101 3	95 7	104.0	97 3	109.6	93 6	100.0	106.5	97.5	98.9	102.7	--	--	--
Machine index, %[c]	109.9	96 3	81.5	96.3	90.1	112.3	90 1	108.6	101.2	95.1	111.1	93.8	--	--	--
Reported bursting strength, p.s.i.															
Cur. machine av.	69	70	73	68	77	71	63	69	72	66	75	66	70	70	100.0
Cum. machine av.	70	69	76	66	78	70	65	76	84	69	67	66	--	--	--
Machine factor, %[b]	98.6	101.4	96 1	103.0	98 7	101.4	96.9	90.8	85.7	95.7	111.9	100.0	--	--	--
Machine index, %[c]	98.6	100.0	104.3	97.1	110.0	101.4	90.0	98.6	102.9	94 3	107.1	94.3	--	--	--

[a] FKI index, % = [cur. FKI av /cum. FKI av.] x 100
[b] Machine factor, % = [cur. machine av./cum. machine av] x 100
[c] Machine index, % = [cur. machine av./cum FKI av] x 100.
[d] Reported basis weight average adjusted to moisture content of 7.8% by the following formula:
Basis weight adjusted to 7.8% moisture content = basis weight at reported moisture content x % fiber at reported moisture content/% fiber at 7 8% moisture content

[e] No data were submitted for this grade for the following machines B, C, D, E, G, I, K, L, M, P, Q, S, [illegible], [illegible], [illegible], AA, BB, DD, EE, and FF

TABLE II

AVERAGES FOR AUGUST, 1966, OF ROUTINE MILL QUALITY CONTROL DATA FOR 33-LB. FOURDRINIER KRAFT LINERBOARD

Machine code	A	F	H	J	O	P	R	V	Y	AA	CC	Cur FKI Av	Cum. FKI Av.	FKI Index, %[a]
Reported moisture content, %														
Cur. machine av.	5 5	6 7	5.3	5 8	5.0	5 2	4 4	5.8	6.3	3 4	5.4	5.3	5 6	94 6
Cum. machine av.	5.6	6.6	5.3	5 6	5 0	5.0	4.6	5.9	5 8	4 0	5 5	--	--	--
Machine factor, %[b]	98 2	101 5	100.0	103 6	100 0	104.0	95.7	98 3	108 6	35 0	38.2	--	--	--
Machine index, %[c]	98 2	119 6	94.6	103 6	89.3	92.9	78.6	103 6	112.5	60.7	96 4	--	--	--
Reported basis weight, lb./M ft.^{2}														
Cur. machine av	33.9	33.4	33 3	33.5	32.4	33.1	33.7	33.3	33.3	34.0	33.7	33 4	33 2	100.6
Cum. machine av.	33 6	33 2	33.4	33 4	32 2	33.5	33.3	33.1	33.2	33.6	33.8	--	--	--
Machine factor, %[b]	100.9	100.6	99 7	100.3	100.6	98 8	101.2	100 6	100 3	101.2	99.7	--	--	--
Machine index, %[c]	102 1	100 6	100.3	100.9	97.6	99.7	101 5	100 3	100 3	102 4	101.5	--	--	--
Adjusted basis weight, lb /M ft.^{2}[d]														
Cur machine av.	34.7	33.8	34 2	34.2	33.4	34.0	34 9	34.0	33.8	35 6	34.6	34.3	34.0	100.9
Cum machine av.	34.4	33.7	34 3	34.2	33 1	34 5	34 5	33.8	33 8	35.0	34.6	--	--	--
Machine factor, %[b]	100.9	100 3	99 7	100.0	100.9	98.6	101.2	100.6	100.0	101.7	100.0	--	--	--
Machine index, %[c]	102.1	99.4	100.6	100.6	98.2	100 0	102.6	100.0	99.4	104.7	101.8	--	--	--
Reported caliper, pt.														
Cur. machine av.	10.1	10.0	9 2	10.1	11.1	10 1	9.3	10.0	9 9	10.6	10.0	10.0	9.9	101 0
Cum machine av.	10.0	10.0	9 0	9.9	10.5	10 0	10.1	9.7	9.8	10.1	9.8	--	--	--
Machine factor, %[b]	101 0	100 0	102.2	102 0	105 7	101.0	92.1	103.1	101.0	105.0	102.0	--	--	--
Machine index, %[c]	102 0	101.0	92.9	102.0	112 1	102.0	93 9	101.0	100 0	107.1	101.0	--	--	--
Reported bursting strength, p.s.i														
Cur machine av.	81	88	94	83	81	90	83	86	77	83	82	84	86	97 7
Cum. machine av.	81	84	93	83	81	87	84	103	81	88	81	--	--	--
Machine factor, %[b]	100 0	104.8	101.1	100 0	100.0	103.4	98.8	83.5	95.1	94.3	101.2	--	--	--
Machine index, %[c]	94 2	102.3	109.3	96.5	94 2	104 7	96.5	100.0	89 5	96 5	95.3	--	--	--

[a] FKI index, % = [Cur. FKI av /Cum. FKI av] x 100
[b] Machine factor, % = [Cur. machine av /Cum. machine av] x 100.
[c] Machine index, % = [Cur. machine av./Cum. FKI av] x 100
[d] Adjusted basis weight average adjusted to moisture content of 7 8% by the following formula
Adjusted basis weight = basis weight at reported moisture content x % fiber at reported moisture content/% fiber at 7 8% moisture content.

Note: Data were submitted for this grade for the following machines: B, C, D, E, G, I, K, L, M, N, O, S, T, U, V, X, Z, BB, DD, EE, and FF

TABLE III

AVERAGES FOR AUGUST, 1966, OF ROUTINE MILL QUALITY CONTROL DATA FOR 38-LB. FOURDRINIER KRAFT LINERBOARD

Machine code	A	C	E	H	O	Q	R	T	W	AA	BB	Cur. FKI Av.	Cum. FKI Av.	FKI Index, %[a]
Reported moisture content, %														
Cur. machine av.	6.7	5.7	6.2	5.4	5.9	6.9	4.6	5.7	6.1	4.5	6.1	5.8	5.9	98.3
Cum. machine av.	6.5	5.6	6.5	5.4	5.9	6.4	--	5.7	6.0	4.3	6.6	--	--	--
Machine factor, %[b]	103.1	101.8	95.4	100.0	100.0	107.8	--	100.0	101.7	104.7	92.4	--	--	--
Machine index, %[c]	113.6	96.6	105.1	91.5	100.0	116.9	78.0	96.6	103.4	76.3	103.4	--	--	--
Reported basis weight, lb./M ft.^{2}														
Cur. machine av.	38.5	38.6	38.0	38.3	37.7	38.5	37.8	38.0	37.9	39.0	38.1	38.2	38.3	99.7
Cum. machine av.	38.5	38.9	37.9	38.2	37.4	38.6	--	37.9	37.9	38.7	38.2	--	--	--
Machine factor, %[b]	100.0	99.2	100.3	100.3	100.8	99.7	--	100.3	100.0	100.8	99.7	--	--	--
Machine index, %[c]	100.5	100.8	99.2	100.0	98.4	100.5	98.7	99.2	99.0	101.8	99.5	--	--	--
Adjusted basis weight, lb./M ft.^{2}[d]														
Cur. machine av.	39.0	39.5	38.6	39.3	38.5	38.9	39.1	38.9	38.6	40.4	38.8	39.1	39.1	100.0
Cum. machine av.	39.0	39.8	38.4	39.2	38.2	39.1	--	38.8	38.6	40.2	38.6	--	--	--
Machine factor, %[b]	100.0	99.2	100.5	100.3	100.8	99.5	--	100.3	100.0	100.5	100.5	--	--	--
Machine index, %[c]	99.7	101.0	98.7	100.5	98.5	99.5	100.0	99.5	98.7	103.3	99.2	--	--	--
Reported caliper, pt.														
Cur. machine av.	11.2	11.8	11.0	10.7	12.1	11.5	10.6	11.3	10.0	11.8	10.8	11.2	11.3	99.1
Cum. machine av.	11.2	11.6	11.4	10.7	11.7	11.5	--	11.1	10.2	11.6	11.1	--	--	--
Machine factor, %[b]	100.0	101.7	96.5	100.0	103.4	100.0	--	101.8	98.0	101.7	97.3	--	--	--
Machine index, %[c]	99.1	104.4	97.3	94.7	107.1	101.8	93.8	100.0	88.5	104.4	95.6	--	--	--
Reported bursting strength, p.s.i.														
Cur. machine av.	93	95	97	102	98	99	86	101	108	92	94	97	99	98.0
Cum. machine av.	94	100	99	105	96	99	--	103	110	95	95	--	--	--
Machine factor, %[b]	98.9	95.0	98.0	97.1	102.1	100.0	--	98.1	98.2	96.8	98.9	--	--	--
Machine index, %[c]	93.9	96.0	98.0	103.0	99.0	100.0	86.9	102.0	109.1	92.9	94.9	--	--	--

[a] FKI index, % = [cur. FKI av./cum. FKI av.] x 100.
[b] Machine factor, % = [cur. machine av./cum. machine av.] x 100.
[c] Machine index, % = [cur. machine av./cum. FKI av.] x 100.
[d] Reported basis weight average adjusted to moisture content of 7.8% by the following formula:
basis weight adjusted to 7.8% moisture content = basis weight at reported moisture content x % fiber at reported moisture content/% fiber at 7.8% moisture content.

Note: No data were submitted for this grade for the following machines: B, D, F, G, I, J, K, L, M, N, P, S, U, V, X, Y, Z, CC, DD, EE, and FF.

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TABLE V

AVERAGES FOR AUGUST, 1966, OF ROUTINE MILL QUALITY CONTROL DATA FOR 69-LB FOURDRINIER KRAFT LINERBOARD

Machine code	A	B	C	D	E	F	I	K	L	M	Q	R	S	U	X	[illegible]	Z	AA	BB	Cur FKI Av	Cum FKI Av	FKI Index, %[a]
Reported moisture content, %																						
Cur machine av	6 7	5 8	6 7	6 1	7 8	6 8	6 8	6 4	5 7	5 7	6 6	6 0	6 2	5 6	6 5	6 8	6 9	4 5	8 2	6 4	6 4	100 0
Cum machine av	6 3	5 9	6 4	--	7 9	7 0	6 8	6 5	5 8	6 4	6 8	5 7	6 2	5 8	6 6	6 7	6 6	4 6	7 2	--	--	--
Machine factor, %[b]	106 3	98 3	104 7	--	98 7	97 1	100 0	98 5	98 3	89 1	97 1	105 3	100 0	96 6	98 5	101 5	104 5	97 8	113 9	--	--	--
Machine index, %[c]	104 7	90 6	104 7	95 3	121 9	106 2	106 2	100 0	89 1	89 1	103 1	93 8	96 9	87 5	101 6	106 2	107 8	70 3	128 1	--	--	--
Reported basis weight, lb /M ft ^{2}																						
Cur machine av	69 4	68 2	69 1	70 3	69 0	69 1	70 0	67 9	68 8	69 5	69 3	68 2	69 5	69 2	68 9	69 6	69 3	71 3	69 5	69 3	69 1	100 0
Cum machine av	69 4	68 0	69 6	--	68 9	69 4	70 0	68 2	68 8	68 7	69 4	68 5	69 3	68 9	69 1	70 0	69 5	70 4	69 3	--	--	--
Machine factor, %[b]	100 0	99 9	99 0	--	100 1	99 6	100 0	99 6	100 0	101 2	99 9	99 6	100 3	100 4	99 7	99 4	99 7	101 3	100 3	--	--	--
Machine index, %[c]	100 4	98 7	100 0	101 7	99 9	100 0	101 3	98 3	99 6	100 6	100 0	98 7	100 6	100 1	99 7	100 7	100 3	103 2	100 6	--	--	--
Adjusted basis weight, lb /M ft ^{2}[d]																						
Cur machine av	70 2	69 7	69 9	71 6	69 0	69 9	70 8	68 9	70 4	71 1	70 2	69 6	70 7	70 9	69 9	70 4	70 0	73 9	69 2	70 0	70 2	100 1
Cum machine av	70 6	69 7	70 6	--	68 8	70 0	70 8	69 2	70 2	69 7	70 2	70 1	70 4	70 4	70 0	70 8	70 4	72 9	69 8	--	--	--
Machine factor, %[b]	99 4	100 0	99 0	--	100 3	99 9	100 0	99 6	100 3	102 0	100 0	99 3	100 4	100 7	99 9	99 4	99 4	101 4	99 1	--	--	--
Machine index, %[c]	100 0	99 3	99 6	102 0	98 3	99 6	100 9	98 1	100 0	101 0	100 0	99 1	100 7	101 0	99 6	100 3	99 7	105 3	98 6	--	--	--
Reported caliper, pt																						
Cur machine a	20 4	19 5	19 0	19 7	19 8	20 1	19 0	19 3	19 6	19 5	21 2	18 5	18 9	19 4	19 0	19 8	20 6	21 2	18 8	19 6	19 7	99 5
Cum machine av	20 5	19 9	19 1	--	19 6	19 8	19 4	19 3	20 0	19 8	20 6	18 8	18 3	19 3	18 9	19 9	20 8	20 4	19 0	--	--	--
Machine factor, %[b]	99 5	98 0	99 5	--	101 0	101 5	97 9	100 0	98 0	98 5	102 9	98 4	100 5	100 5	100 5	99 5	99 0	103 9	98 9	--	--	--
Machine index, %[c]	101 6	99 0	96 4	100 0	100 5	102 0	96 4	98 0	99 5	99 0	107 6	93 9	95 9	98 5	96 4	100 5	104 6	107 6	95 4	--	--	--
Reported bursting strength, p s i																						
Cur machine a	142	139	141	156	145	152	149	138	140	134	141	137	146	159	156	141	145	141	146	144	144	100 0
Cum machine av	142	139	142	--	148	156	151	138	140	136	145	137	149	159	160	140	144	140	142	--	--	--
Machine factor, %[b]	100 0	100 0	99 3	--	98 5	97 4	98 7	100 0	100 0	98 5	97 2	100 0	98 0	100 0	97 5	100 7	98 0	100 7	100 0	--	--	--
Machine index, %[c]	93 6	96 5	97 0	108 3	101 4	105 6	103 5	95 8	97 2	93 1	97 9	95 1	101 4	110 4	108 3	97 9	100 7	97 9	97 2	--	--	--

[a] FKI Index, % = (Cum FKI av /Cum FKI av) x 100
[b] Machine factor, % = (Cur machine a /Cum machine a) x 100
[c] Machine index, % = (Cur machine av /Cum FKI av) x 100
[d] Reported basis weight average adjusted to moisture content of 7 3% by the following formula
Adjusted basis weight adjusted to 7 3% moisture content = basis weight at reported moisture content x % fiber
reported moisture content/% fiber at 7 3% moisture conte t

- [illegible] data were summarized for this grade for the following machines C, [illegible], [illegible], [illegible], O, P, T, [illegible], [illegible], CC, DD, [illegible], and [illegible]

TABLE VI

AVERAGES FOR AUGUST, 1966, OF ROUTINE MILL QUALITY CONTROL DATA FOR 90-LB. FOURDRINIER KRAFT LINERBOARD

Machine code	E	F	I	K	U	Y	BB	Cur. FKI Av.	Cum. FKI Av.	FKI Index, %[a]
Reported moisture content, %										
Cur. machine av.	7.8	7.3	7.0	6.5	6.3	7.0	8.0	7.1	6.7	106.0
Cum. machine av.	7 8	7.3	6.6	6.6	6.4	6.9	7.0	--	--	--
Machine factor, %[b]	100.0	100.0	106.1	98.5	98 4	101.4	114.3	--	--	--
Machine index, %[c]	116.4	109.0	104.5	97 0	94.0	104.5	119.4	--	--	--
Reported basis weight, lb./M ft.^{2}										
Cur. machine av.	90.2	90.1	90.9	89 1	90.1	91 6	90.4	90.3	90 0	100.3
Cum machine av.	90.2	88.7	91.0	89.2	89.9	91.0	90.0	--	--	--
Machine factor, %[b]	100.0	101.6	99.9	99.9	100.2	100.7	100.4	--	--	--
Machine index, %[c]	100.2	100.1	101 0	99 0	100 1	101.8	100.4	--	--	--
Adjusted basis weight, lb /M ft ^{2}[d]										
Cur machine av.	90 2	90.6	91.7	90.3	91.5	92.4	90.2	91 0	90 0	100.0
Cum machine av.	90.2	89.1	92.2	90.4	91.2	92 0	90.8	--	--	--
Machine factor, %[b]	100 0	101.7	99.5	99.9	100.3	100.4	99.3	--	--	--
Machine index, %[c]	99.1	99.6	100 8	99 2	100.5	101.5	99.1	--	--	--
Reported caliper, pt.										
Cur. machine av.	25 9	24.1	24 9	23 9	24 6	26.1	24.6	24.9	24.7	100.8
Cum machine av.	25.7	23.9	25 0	23.4	25.0	26.0	25.0	--	--	--
Machine factor, %[b]	100.8	100.8	99.6	102.1	98.4	100.4	98.4	--	--	--
Machine index, %[c]	104.9	97.6	100.8	96.8	99.6	105.7	99.6	--	--	--
Reported bursting strength, p s.i.										
Cur. machine av.	170	194	178	156	184	170	165	174	173	100 6
Cum. machine av.	173	183	178	155	190	168	166	--	--	--
Machine factor, %[b]	98.3	106.0	100.0	100.6	96.8	101.2	99.4	--	--	--
Machine index, %[c]	98 3	112.1	102.9	90.2	106.4	98.3	95.4	--	--	--

[a] FKI index, % = [cur FKI av./cum. FKI av.] x 100.
[b] Machine factor, % = [cur. machine av./cum. machine av.] x 100.
[c] Machine index, % = [cur. machine av./cum. FKI av.] x 100.
[d] Reported basis weight average adjusted to moisture content of 7.8% by the following formula
basis weight adjusted to 7.8% moisture content = basis weight at reported moisture content x % fiber at reported moisture content/% fiber at 7 8% moisture content.

Note: No data were submitted for this grade for the following machines: A, B, C, D, G, H, J, L, M, N, O, P, Q, R, S, T, V, W, X, Z, AA, CC, DD, EE, and FF.

TABLE VII

AVERAGES FOR SEPTEMBER, 1966, OF ROUTINE MILL QUALITY DATA FOR 26-LB. FOURDRINIER KRAFT LINERBOARD

Machine code	A	F	J	N	O	T	Y	CC	Cur FKI Av.	Cum. FKI Av.	FKI Index, %[a]
Reported moisture content, %											
Cur. machine av.	5.3	6.9	5.5	5.4	4.7	5.5	5.4	5.4	5.5	5.4	101.9
Cum. machine av.	5.5	6.7	5.5	5.3	4.9	5.4	5.4	5.0	--	--	--
Machine factor, %[b]	96.4	103.0	100.0	101.9	95.9	101.9	100.0	108.0	--	--	--
Machine index, %[c]	98.1	127.8	101.9	100.0	87.0	101.9	100.0	100.0	--	--	--
Reported basis weight, lb./M ft.^{2}											
Cur. machine av.	26.8	26.4	26.7	26.3	25.9	27.0	26.8	26.7	26.6	26.7	99.6
Cum. machine av.	26.9	26.8	26.6	26.2	26.0	26.9	26.7	27.0	--	--	--
Machine factor, %[b]	99.6	98.5	100.4	100.4	99.6	100.4	100.4	98.9	--	--	--
Machine index, %[c]	100.4	98.9	100.0	98.5	97.0	101.1	100.4	100.0	--	--	--
Adjusted basis weight, lb./M ft.^{2}[d]											
Cur. machine av.	27.5	26.7	27.4	27.0	26.8	27.7	27.5	27.4	27.2	27.3	99.6
Cum. machine av.	27.5	27.2	27.3	26.9	26.8	27.6	27.4	27.8	--	--	--
Machine factor, %[b]	100.0	98.2	100.4	100.4	100.0	100.4	100.4	98.6	--	--	--
Machine index, %[c]	100.7	97.8	100.4	98.9	98.2	101.5	100.7	100.4	--	--	--
Reported caliper, pt.											
Cur. machine av.	8.7	7.0	7.7	7.3	8.4	8.6	8.2	7.3	7.9	8.1	97.5
Cum. machine av.	8.7	7.7	7.5	7.4	8.5	8.8	7.8	7.5	--	--	--
Machine factor, %[b]	100.0	90.9	102.7	98.6	98.8	97.7	105.1	97.3	--	--	--
Machine index, %[c]	107.4	86.4	95.1	90.1	103.7	106.2	101.2	90.1	--	--	--
Reported bursting strength, p.s.i.											
Cur. machine av.	68	69	68	79	73	69	70	66	70	70	100.0
Cum. machine av.	70	69	66	78	70	74	68	66	--	--	--
Machine factor, %[b]	97.1	100.0	103.0	101.3	104.3	93.2	102.9	100.0	--	--	--
Machine index, %[c]	97.1	98.6	97.1	112.9	104.3	98.6	100.0	94.3	--	--	--

[a] FKI index, % = [cur. FKI av./cum. FKI av.] x 100.
[b] Machine factor, % = [cur. machine av./cum machine av.] x 100
[c] Machine index, % = [cur. machine av /cum FKI av.] x 100.
[d] Reported basis weight average adjusted to moisture content of 7.8% by the following formula
basis weight adjusted to 7.8% moisture content = basis weight at reported moisture content x % fiber at reported moisture content/% fiber at 7.8% moisture content

Note: No data were submitted for this grade for the following machines B, C, D, E, G, H, I, K, L, M, P, Q, R, S, U, V, W, X, Z, AA, BB, DD, EE, and FF.

TABLE VIII

AVERAGES FOR SEPTEMBER, 1966, OF ROUTINE MILL QUALITY CONTROL DATA FOR 33-LB. FOURDRINIER KRAFT LINERBOARD

Machine code	A	F	G	H	J	O	T	V	Y	AA	CC	Cur. FKI Av.	Cum. FKI Av.	FKI Index, %[a]
Reported moisture content, %														
Cur. machine av.	5 7	6.7	6.2	5.4	5.7	4.6	6.4	5 7	6.1	3 6	5.3	5.6	5 6	100.0
Cum. machine av.	5.6	6.6	6 0	5.3	5.6	5.0	5.9	5.8	5.9	3.9	5.5	--	--	--
Machine factor, %[b]	101.8	101.5	103.3	101.9	101.8	92 0	108.5	98.3	103.4	92.3	96.4	--	--	--
Machine index, %[c]	101 8	119.6	110.7	96 4	101 8	82.1	114.3	101.8	108.9	64.3	94.6	--	--	--
Reported basis weight, lb./M ft.[2]														
Cur. machine av.	33 7	33.4	34.5	33.4	33.5	32.2	32.7	33 4	33.4	33 3	33.7	33 4	33.3	100.3
Cum. machine av	33.7	33.3	33.3	33.4	33.4	32.2	33 0	33.2	33.2	33.7	33.8	--	--	--
Machine factor, %[b]	100 0	100.3	103.6	100 0	100.3	100 0	99.1	100.6	100.6	98.8	99 7	--	--	--
Machine index, %[c]	101.2	100 3	103 6	100.3	100 6	96.7	98 2	100.3	100.3	100.0	101.2	--	--	--
Adjusted basis weight, lb /M ft[2] [d]														
Cur. machine av.	34.5	33.3	35 1	34.3	34.3	33.3	33.2	34.2	34.0	34.8	34.6	34 2	34.1	100.3
Cum. machine av.	34.5	33 7	33.9	34.3	34.2	33.2	33.7	33.9	33.8	35 1	34.6	--	--	--
Machine factor, %[b]	100 0	100 3	103 5	100.0	100 3	100.3	98 5	100.9	100.6	99 1	100 0	--	--	--
Machine index, %[c]	101.2	99.1	102.9	100.6	100.6	97.7	97.4	100.3	99.7	102 1	101.5	--	--	--
Reported caliper, pt.														
Cur machine av	10.1	10.0	--	8 9	10.0	10.6	9.6	9.4	10.0	10 3	9 5	9.8	9.9	99 0
Cum machine av.	10.0	10.0	9.6	9 1	9.9	10 6	9.7	9 8	9.8	10 2	9 9	--	--	--
Machine factor, %[b]	101.0	100.0	--	97 8	101 0	100.0	99 0	95.9	102.0	101.0	96.0	--	--	--
Machine index, %[c]	102.0	101.0	--	89 9	101.0	107 1	97 0	94.9	101.0	104 0	96 0	--	--	--
Reported bursting strength, p s.i.														
Cur. machine av.	80	84	93	97	82	86	92	77	81	88	81	86	85	101.2
Cum machine av.	81	86	81	93	83	81	93	94	80	87	81	--	--	--
Machine factor, %[b]	98.8	97.7	114 8	104.3	98 8	106.2	98.9	81.9	101.2	101.1	100.0	--	--	--
Machine index, %[c]	94.1	98.8	109 4	114.1	96.5	101.2	108 2	90.6	95.3	103.5	95.3	--	--	--

[a] FKI index, % = [cur. FKI av./cum. FKI av.] x 100.
[b] Machine factor, % = [cur. machine av./cum. machine av.] x 100.
[c] Machine index, % = [cur. machine av./cum FKI av.] x 100.
[d] Reported basis weight average adjusted to moisture content of 7.8% by the following formula:
basis weight adjusted to 7.8% moisture content = basis weight at reported moisture content x % fiber at reported moisture content/% fiber at 7 8% moisture content.

Note: No data were submitted for this grade for the following machines B, C, D, E, I, K, L, M, N, P, Q, R, S, U, W, X, Z, BB, DD, EE, and FF.

TABLE IX

AVERAGES FOR SEPTEMBER, 1966, OF ROUTINE MILL QUALITY DATA FOR 38-LB FOURDRINIER KRAFT LINERBOARD

Machine code	A	C	E	H	O	Q	W	AA	BB	EE	Cur. FKI Av.	Cum. FKI Av	FKI Index, %[a]
Reported moisture content, %													
Cur. machine av.	6 5	6.1	6.4	5.4	5.8	6.6	6.7	5.0	6.9	7.2	6.3	5.9	106.8
Cum. machine av.	6.5	5.6	6.5	5.4	5.9	6.6	6.0	4.3	6.5	--	--	--	--
Machine factor, %[b]	100.0	108.9	98.5	100.0	98.3	100.0	111.7	116.3	106.2	--	--	--	--
Machine index, %[c]	110 2	103.4	108.5	91.5	98.3	111.9	113.6	84.7	116.9	122.0	--	--	--
Reported basis weight, lb./M ft.^{2}													
Cur. machine av.	38.5	38.5	37.8	38.3	37.8	38.5	38.0	38.8	38.1	38.8	38.3	38.3	100.0
Cum. machine av.	38.5	38.9	37.9	38.3	37.5	38.6	37.9	38.8	38.2	--	--	--	--
Machine factor, %[b]	100.0	99.0	99.7	100.0	100.8	99.7	100.3	100.0	99.7	--	--	--	--
Machine index, %[c]	100.5	100.5	98.7	100.0	98.7	100.5	99.2	101.3	99.5	101.3	--	--	--
Adjusted basis weight, lb./M ft.^{2}[d]													
Cur. machine av.	39.0	39.2	38.4	39.3	38.6	39.0	38.5	40.0	38.5	39.1	39.0	39.1	99.7
Cum. machine av.	39.0	39.8	38.5	39.3	38.3	39.1	38.6	40.2	38.7	--	--	--	--
Machine factor, %[b]	100.0	98.5	99.7	100.0	100.8	99.7	99.7	99.5	99.5	--	--	--	--
Machine index, %[c]	99.7	100.3	98.2	100.5	98.7	99.7	98.5	102.3	98.5	100.0	--	--	--
Reported caliper, pt.													
Cur. machine av.	11.4	11.6	11.0	10.4	12.0	11.4	10.2	11.4	10.7	11.2	11.1	11.3	98.2
Cum. machine av.	11.2	11.6	11.3	10.7	11.8	11.5	10.1	11.6	11.0	--	--	--	--
Machine factor, %[b]	101.8	100.0	97.3	97 2	101.7	99.1	101.0	98.3	97.3	--	--	--	--
Machine index, %[c]	100.9	102.7	97 3	92.0	106.2	100.9	90.3	100.9	94.7	99.1	--	--	--
Reported bursting strength, p s.i.													
Cur. machine av.	93	94	99	102	99	97	106	93	93	86	96	98	98.0
Cum machine av.	93	99	99	104	97	99	110	94	95	--	--	--	--
Machine factor, %[b]	100 0	94 9	100.0	98.1	102.1	98.0	96.4	98.9	97.9	--	--	--	--
Machine index, %[c]	94.9	95 9	101.0	104.1	101.0	99.0	108 2	94.9	94.9	87 8	--	--	--

[a] FKI index, % = [cur FKI av./cum. FKI av.] x 100
[b] Machine factor, % = [cur. machine av /cum machine av] x 100
[c] Machine index, % = [cur. machine av /cum FKI av.] x 100.
[d] Reported basis weight average adjusted to moisture content of 7.8% by the following formula:
Basis weight adjusted to 7 8% moisture content = basis weight at reported moisture content x % fiber at reported moisture content/% fiber at 7 8% moisture content

Note: No data were submitted for this grade for the following machines B, D, F, G, I, J, K, L, M, N, P, R, S, T, U, V, X, Y, Z, CC, DD, and FF.

TABLE II

[illegible] DATA, [illegible] OF 69-LB TEST MILL QUALITY CONTROL DATA FOR 69-LB FOURDRINIER KRAFT LINERBOARD

Variable	A	B	C	D	E	F	G	H	K	L	M	N	P	Q	R	S	T	Z	AA	BB	Our FCI av	Our TTI av	TTI Inst. Co, $
Material moisture content, %																							
Our machine av	6 3	5 7	7 0	6 0	7 0	7 0	5 5	6 0	6 0	5 8	6 0	6 2	5 0	6 6	6 4	6 3	7 6	4 5	7 6	5	6 1	10[illegible] 6
Com machine av	6 4	5 9	6 5	6 1	7 0	6 9	6 1	6 0	6 5	5 8	6 1	6 7	5 8	5 8	6 6	6 7	6 6	4 5	7 4	--	--	--
Machine factor, f^b	106 2	96 6	107 7	101 6	96 2	101 [illegible]	101 6	102 3	101 5	100 0	95 2	92 5	100 4	113 8	97 0	101 5	101 5	102 2	102 7	--	--	--
Machine index, I^c	107 [illegible]	95 1	109 [illegible]	40	113 3	109 [illegible]	101 6	102 4	103 1	99 6	93 8	96 9	93 3	103 1	100 0	106 2	107 7	74 9	118 2	--	--	--
Reported basis weight, lb /[illegible] ft ^{2}																							
Our machine a	69 4	68 [illegible]	69 0	70 2	68 9	69 1	68 5	69 5	68 2	69 1	69 1	69 4	68 1	69 0	69 0	70 4	69 0	70 4	69 5	69 2	69 2	100 0
Our machine av	69 4	68 3	68 5	70 0	68 9	69 3	67 8	70 0	68 2	68 3	68 8	69 4	68 4	69 0	69 0	69 9	69 4	70 6	69 5	--	--	--
Machine factor, f^b	100 0	99 4	98 3	99 9	100 0	99 7	101 0	99 3	100 0	100 4	100 4	100 0	99 6	100 0	100 0	100 7	100 3	99 7	100 [illegible]	--	--	--
Machine index, I^c	100 3	98 4	99 7	101 4	99 6	99 9	99 0	100 4	98 6	99 9	99 9	100 3	98 4	99 7	99 7	101 7	100 6	101 7	100 4	--	--	--
Adjusted basis weight, lb /[illegible] ft ^{2} [d]																							
Our machine av	70 2	69 7	69 6	71 4	69 0	69 7	68 5	70 1	69 1	70 6	70 5	70 6	69 5	69 9	70 0	71 2	70 4	72 9	69 6	70 2	70 2	100 0
Our machine av	70 5	69 7	70 4	71 6	68 9	70 0	68 8	70 8	69 1	70 2	70 0	70 2	70 0	70 5	70 0	70 7	70 [illegible]	73 1	69 6	--	--	--
Machine factor, f^b	99 6	100 0	98 8	99 7	100 [illegible]	99 6	101 3	99 0	100 0	100 6	100 7	100 6	99 [illegible]	99 1	100 0	100 7	100 1	99 7	100 0	--	--	--
Machine index, I^c	100 0	99 3	99 [illegible]	101 7	98 3	99 3	99 0	99 9	98 4	100 6	100 4	100 [illegible]	99 0	99 6	99 7	101 4	100 3	103 8	99 [illegible]	--	--	--
Reported caliper, pt																							
Our machine av	20 5	19 4	19 8	19 8	19 5	19 9	--	19 3	19 4	20 0	19 8	21 0	18 5	19 4	18 5	20 1	20 8	20 6	19 8	19 8	19 7	100 5
Com machine av	20 5	19 8	19 1	19 7	19 7	19 8	18 8	19 3	19 3	19 9	19 7	20 8	18 8	19 3	18 9	19 9	20 7	20 6	19 0	--	--	--
Machine factor, f^b	100 0	98 0	100 [illegible]	100 [illegible]	99 0	100 5	--	100 0	100 5	100 5	100 5	101 0	98 4	100 5	97 9	101 0	100 [illegible]	100 0	104 2	--	--	--
Machine index, I^c	104 1	98 5	97 5	100 5	99 0	101 0	--	98 0	98 5	101 5	100 5	106 6	93 9	98 5	95 9	102 0	105 6	104 6	100 5	--	--	--
Reported bursting strength, p s i																							
Our machine a	139	140	140	150	144	150	136	149	138	140	136	141	136	159	151	140	147	140	139	140	144	99 3
Com machine av	142	134	142	156	148	155	140	151	138	140	135	144	137	159	150	140	148	140	140	--	--	--
Machine factor, f^b	97 9	100 7	98 6	96 2	97 3	96 3	97 [illegible]	98 7	100 0	100 0	100 7	97 9	99 3	100 0	94 4	100 0	96 6	100 0	99 [illegible]	--	--	--
Machine index, I^c	96 5	97 2	97 2	104 2	100 0	104 2	94 4	103 5	95 8	97 2	94 [illegible]	97 9	94 4	110 4	104 9	97 2	99 3	97 2	96 5	--	--	--

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[illegible] index, f = [our TTI a /com TTI av] x 100
[illegible] factor, f = [our machine a /com machine a] x 100
[illegible] index, I = [our material a /com TTI av] x 100
[illegible] basis weight adjusted to moisture content of 7 8% b, the following formula
[illegible] basis weight adjusted to 7 8% moisture content = basis weight at reported moisture content x % fiber
[illegible] [illegible] moisture /% fiber at 7 8% moisture content.

[illegible] [illegible] [illegible] [illegible] [illegible] grade [illegible] the follow[illegible] machine [illegible], G, [illegible], O, P, S, T, V, W, [illegible], [illegible], [illegible], [illegible]

TABLE XII

AVERAGES FOR SEPTEMBER, 1966, OF ROUTINE MILL QUALITY CONTROL DATA FOR 90-LB. FOURDRINIER KRAFT LINERBOARD

Machine code	E	I	K	U	X	BB	Cur. FKI Av.	Cum. FKI Av	FKI Index, %[a]
Reported moisture content, %									
Cur. machine av.	7.5	6 7	6.7	6.9	6.3	7.4	6.9	6 8	101.5
Cum. machine av.	7.8	6.7	6 6	6.4	6.6	7.4	--	--	--
Machine factor, %[b]	96.2	100.0	101.5	107.8	95.5	100.0	--	--	--
Machine index, %[c]	110.3	98.5	98.5	101.5	92.6	108.8	--	--	--
Reported basis weight, lb./M ft.^{2}									
Cur. machine av.	89.8	91.2	89.3	90.0	90.4	90.4	90.2	90.0	100.2
Cum. machine av.	90.2	91.0	89.2	90.0	89.9	90.1	--	--	--
Machine factor, %[b]	99.6	100.2	100.1	100.0	100 6	100.3	--	--	--
Machine index, %[c]	99.8	101.3	99.2	100.0	100.4	100.4	--	--	--
Adjusted basis weight, lb./M ft.^{2}[d]									
Cur machine av.	90.1	92.3	90 4	90.9	91.8	90.8	91.0	91 0	100.0
Cum machine av.	90 2	92.1	90.4	91.3	91.1	90.6	--	--	--
Machine factor, %[b]	99.9	100.2	100 0	99 6	100.8	100.2	--	--	--
Machine index, %[c]	99.0	101.4	99.3	99.9	100.9	99.8	--	--	--
Peported caliper, pt.									
Cur. machine av.	25 7	25.4	23.8	25 8	24.8	25.1	25 1	24.8	101.2
Cum. machine av.	25 7	25.0	23 5	24 9	25.2	24.9	--	--	--
Machine factor, %[b]	100 0	101.6	101.3	103.6	98 4	100 8	--	--	--
Machine index, %[c]	103.6	102.4	96.0	104 0	100.0	101.2	--	--	--
Reported bursting strength, p.s.i.									
Cur. machine av.	179	177	153	179	181	164	172	173	99 4
Cum machine av.	172	178	155	188	189	165	--	--	--
Machine factor, %[b]	104.1	99 4	98.7	95.2	95.8	99.4	--	--	--
Machine index, %[c]	103.5	102 3	88.4	103.5	104.6	94.8	--	--	--

[a] FKI index, % = [cur. FKI av./cum. FKI av.] x 100.
[b] Machine factor, % = [cur. machine av./cum machine av.] x 100.
[c] Machine index, % = [cur. machine av./cum. FKI av.] x 100.
[d] Reported basis weight average adjusted to moisture content of 7.8% by the following formula
basis weight adjusted to 7.8% moisture content = basis weight at reported moisture content x % fiber at reported moisture content/% fiber at 7 8% moisture content.

Note No data were submitted for this grade for the following machines A, B, C, D, F, G, H, J, L, M, N, O, P, Q, R, S, T, V, W, Y, Z, AA, CC, DD, EE, and FF.

TABLE XLII

SUMMARY OF DATA ON CONDITIONING AND TESTING ENVIRONMENTS

Machine Code	Are Quality Samples Conditioned Before Testing?	Are Quality Samples Tested Under Controlled Conditions?
A	No	Yes. 50±1% R H , 73±1°F
B	No	No
C	No	Yes 50±10% R.H , 73±4°F
D	No	Yes 50±2% R.H., 73±1°F
E	No	No
F	No	No
G	No	No
H	No	Yes 50±2% R H , 73±3 5°F.
I	No	Yes: 50±2% R.H., 73±1°F
J	No	Yes: 50±10% R H., 73±4°F
K	No	No
L	No	Yes. 50±2% R.H., 73±3.5°F
M	Yes. 5 to 20 min at 50% R.H , 73°F	
N	No	Yes 50±2% R H , 73±3 5°F
O	No	No
P	No	No
Q	No	No
R	No	No
S	No	No
T	No	No
U	No	No
V	No	No
W	No	No
X	No	No
Y	No	No
Z	No	No
AA	Yes Air stream at 50% R H , 73°F	Yes 50±2% R.H., 72±2°F.
BB	No	Yes. 50±2% R.H , 72±3 5°F.
CC	Yes 5 min (Rapid Conditioner)	Yes 50±2% R H., 72±3.5°F
DD	No	No
EE	No	Yes 50±2% R H , 73±3°F
FF	No	Yes. 50±2% R.H , 73±3°F

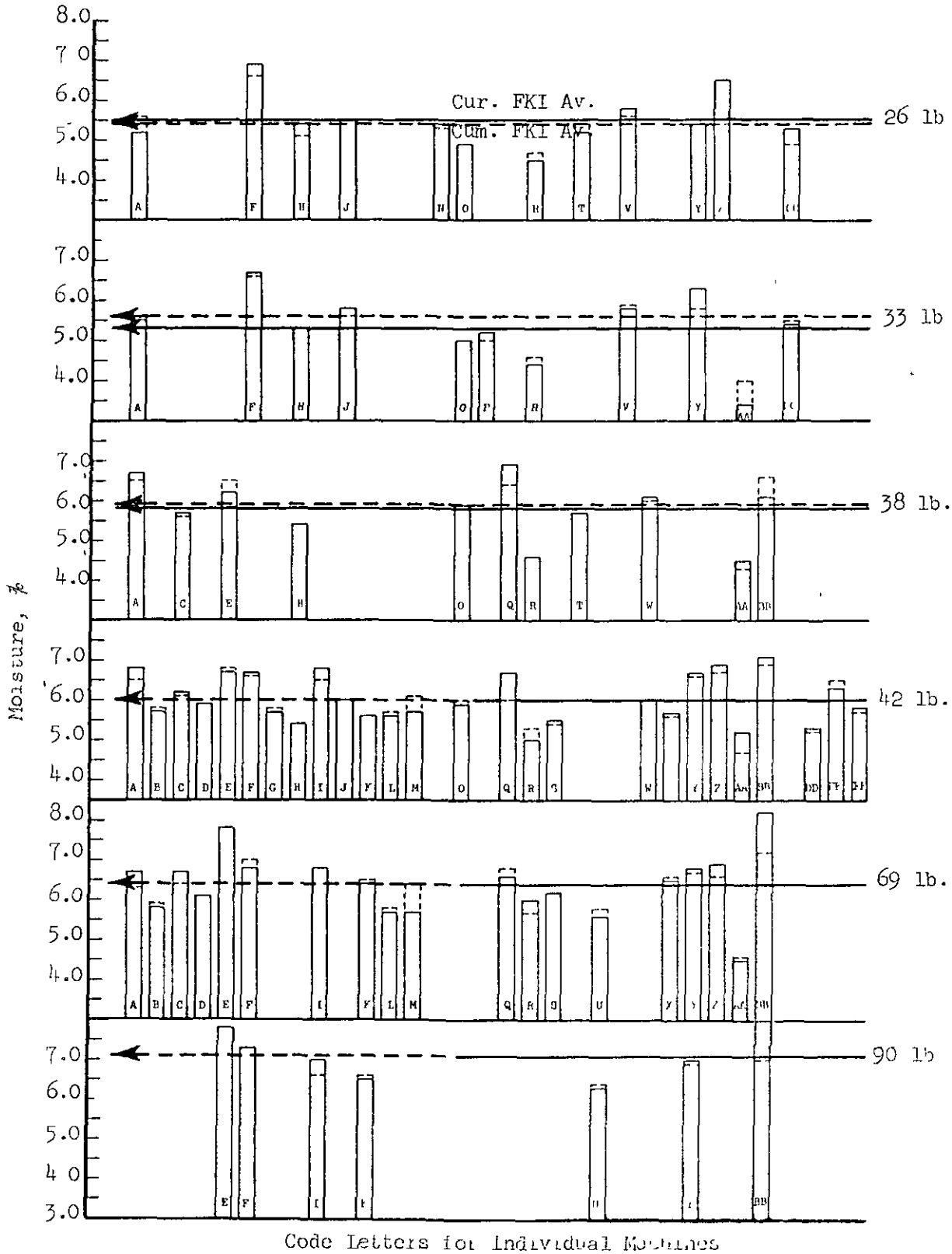

Figure 1. Comparison of Moisture Averages for August, 1966

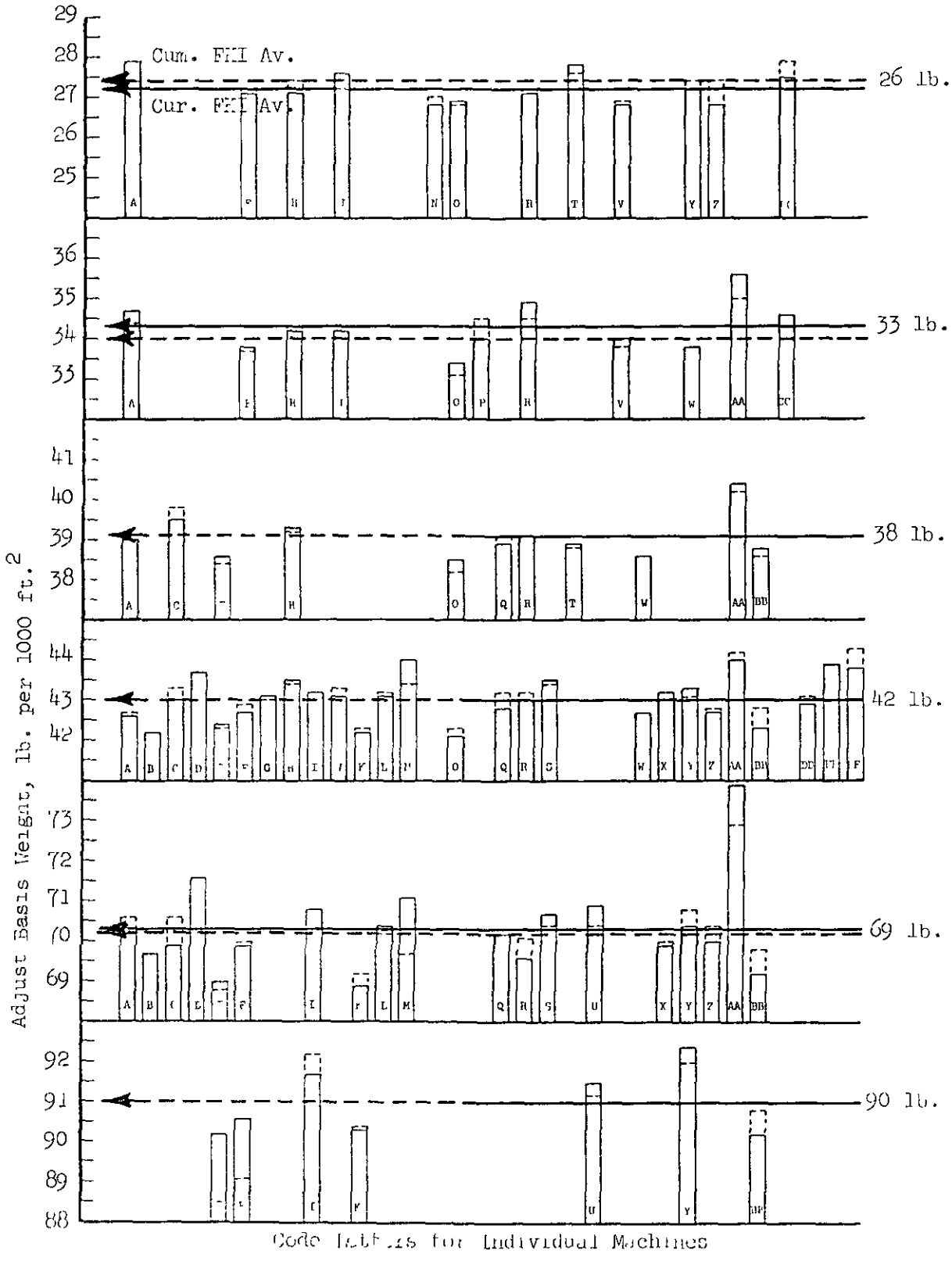

Figure 7. Comparison of Adjusted Basis Weight Averages for Project 1108

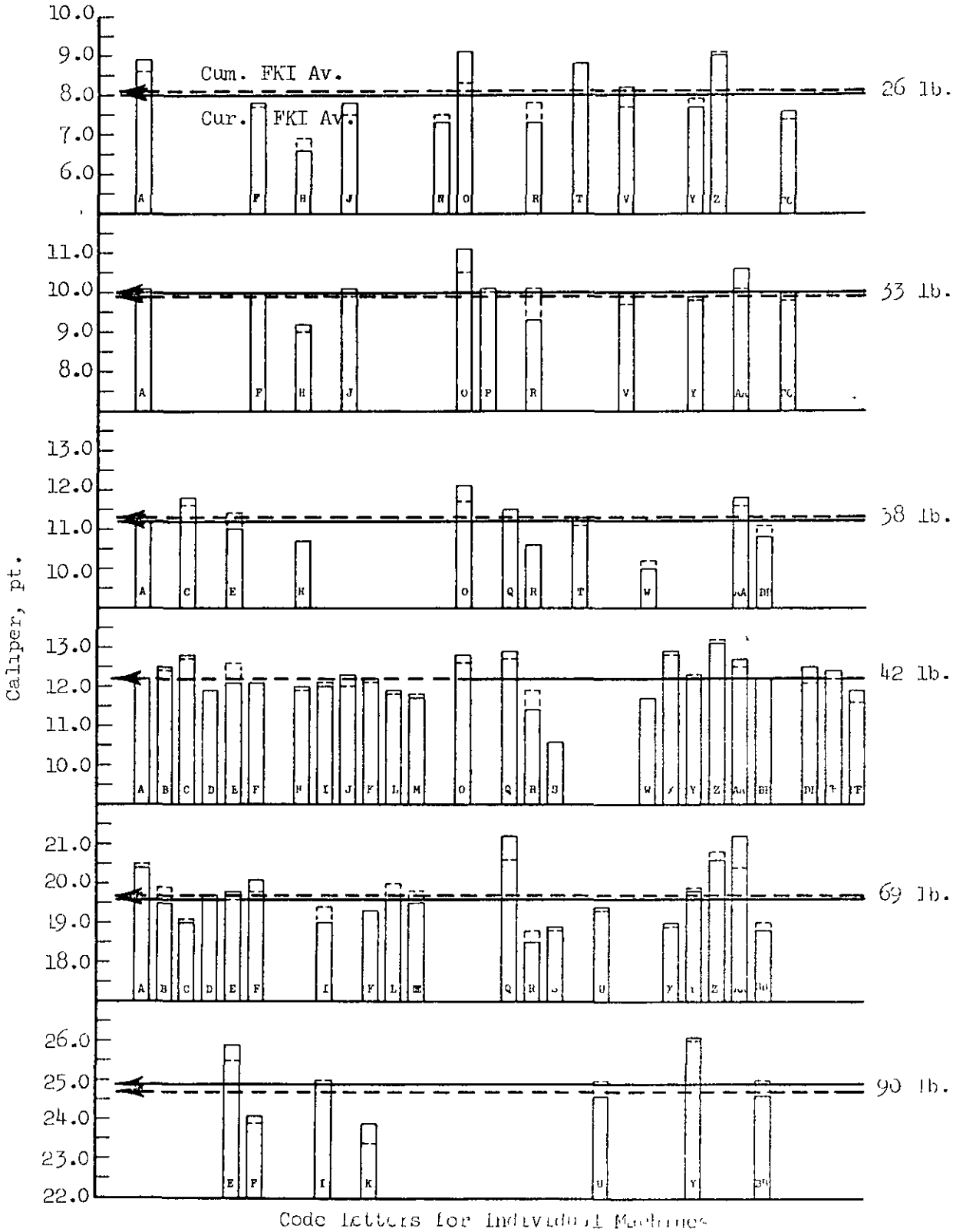

Figure 3. Comparison of Caliper Averages for August, Sept

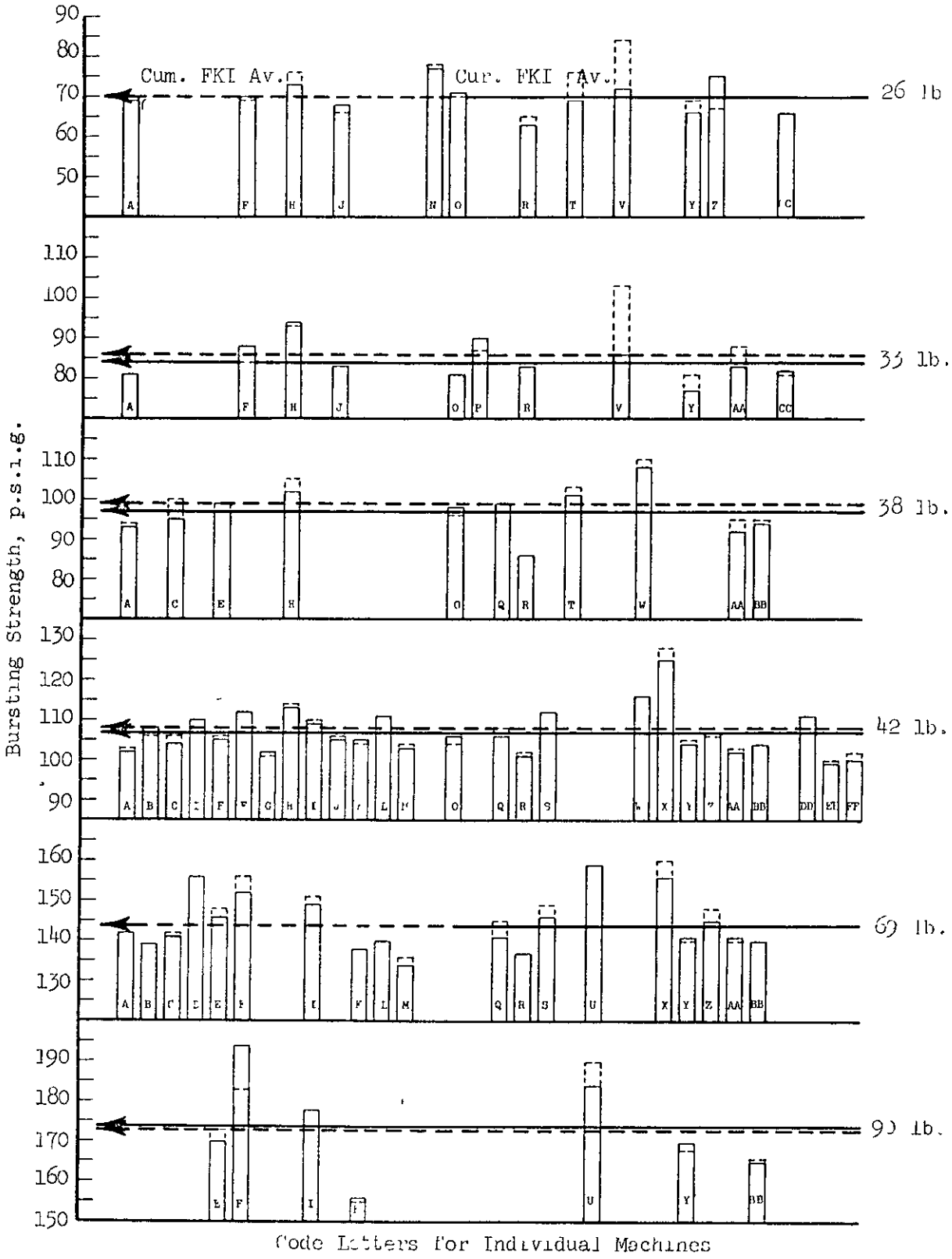

Figure 4. Comparison of Bursting Strength Averages for August, 1966

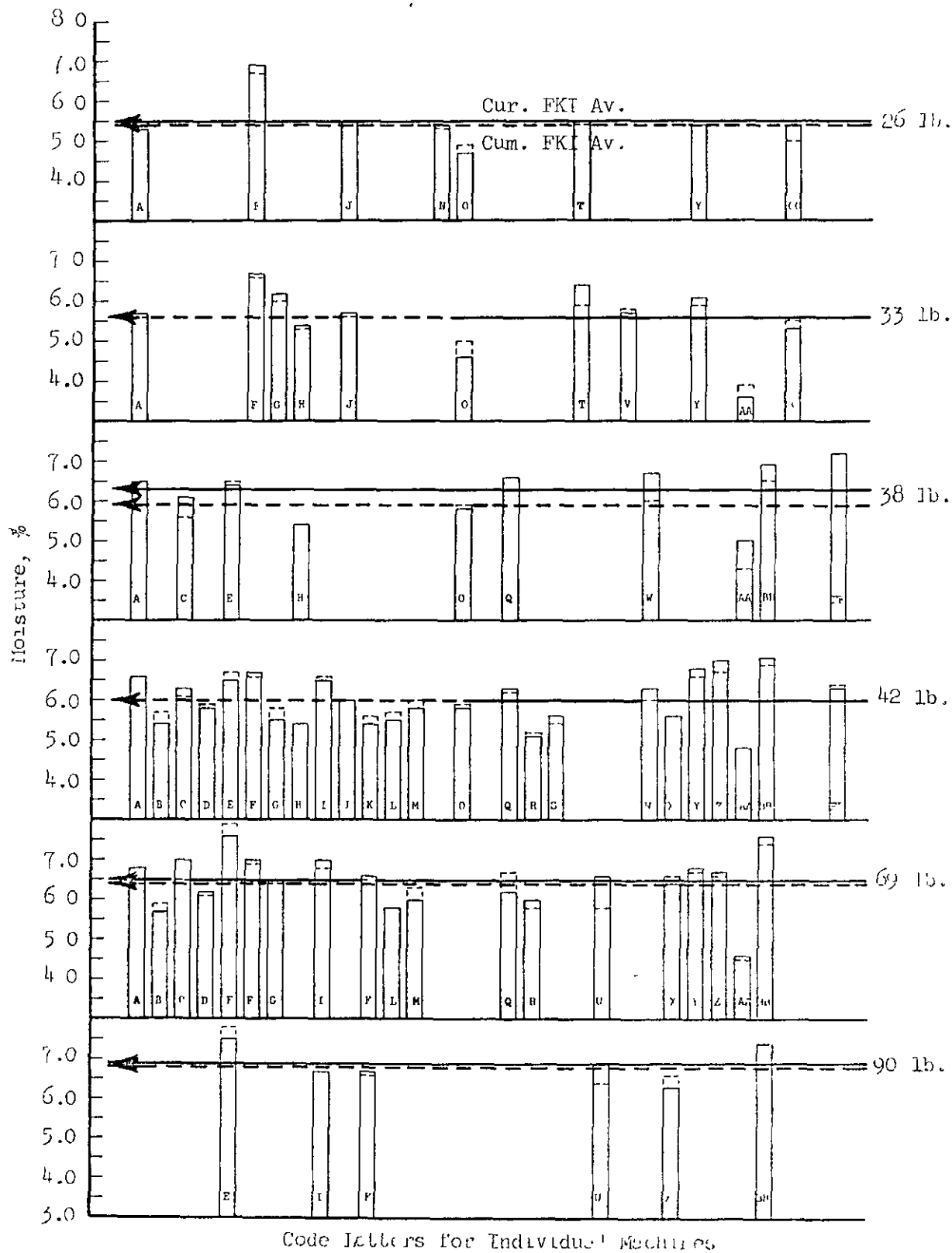

Figure 5. Comparison of Moisture Averages for September, 1950

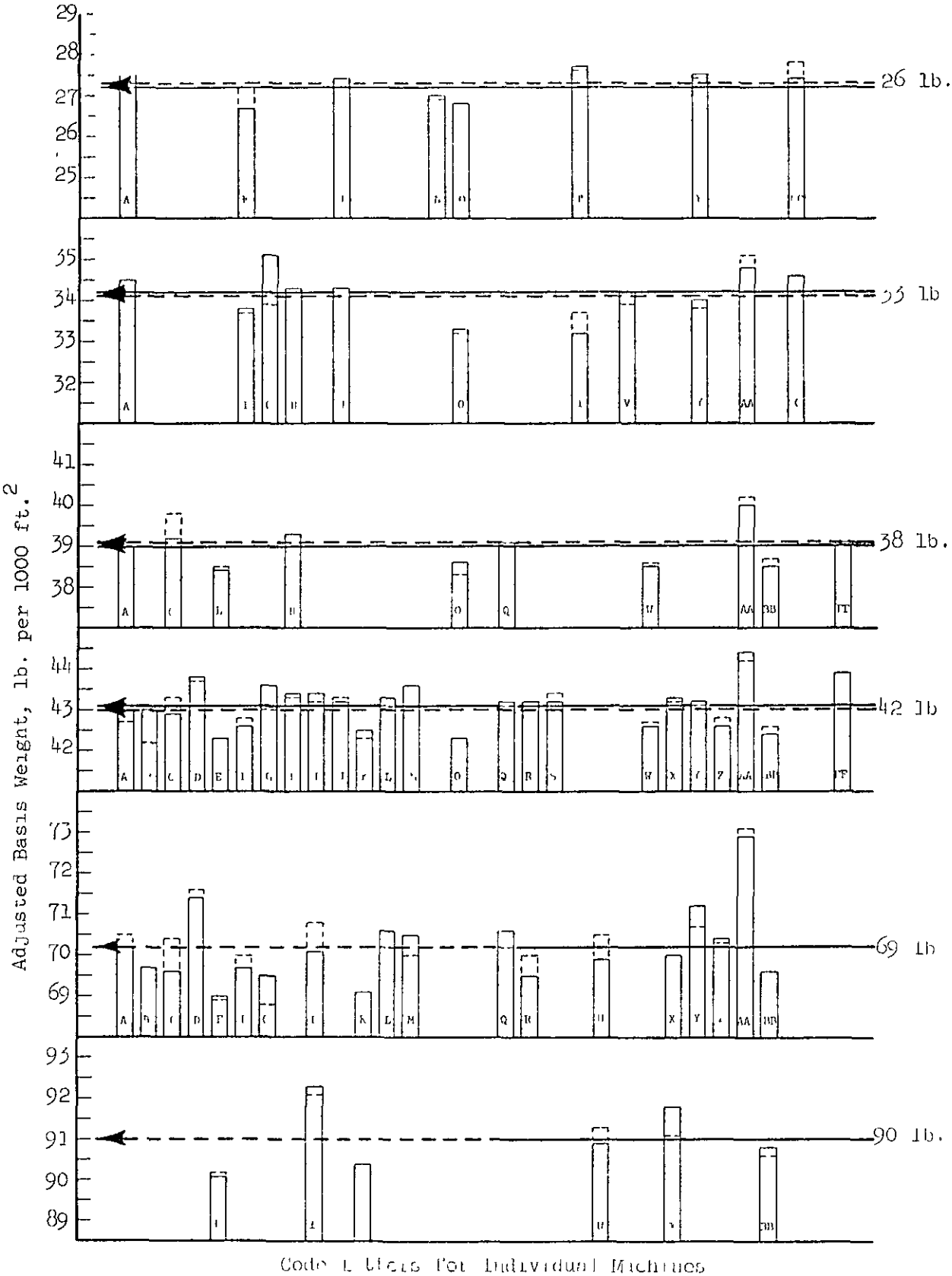

Figure 5 Comparison of Basis Weight Averages for Sept., 1966

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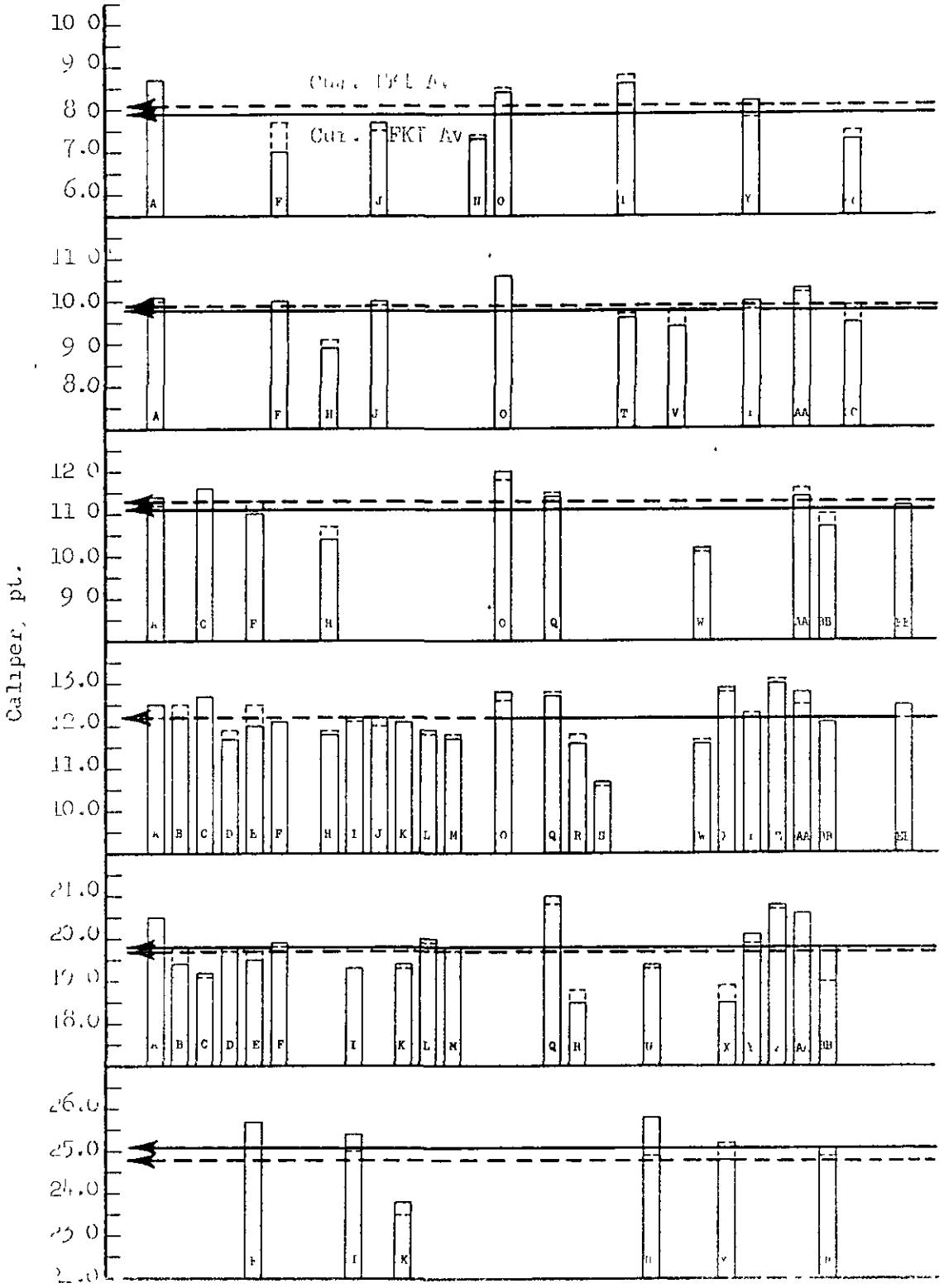

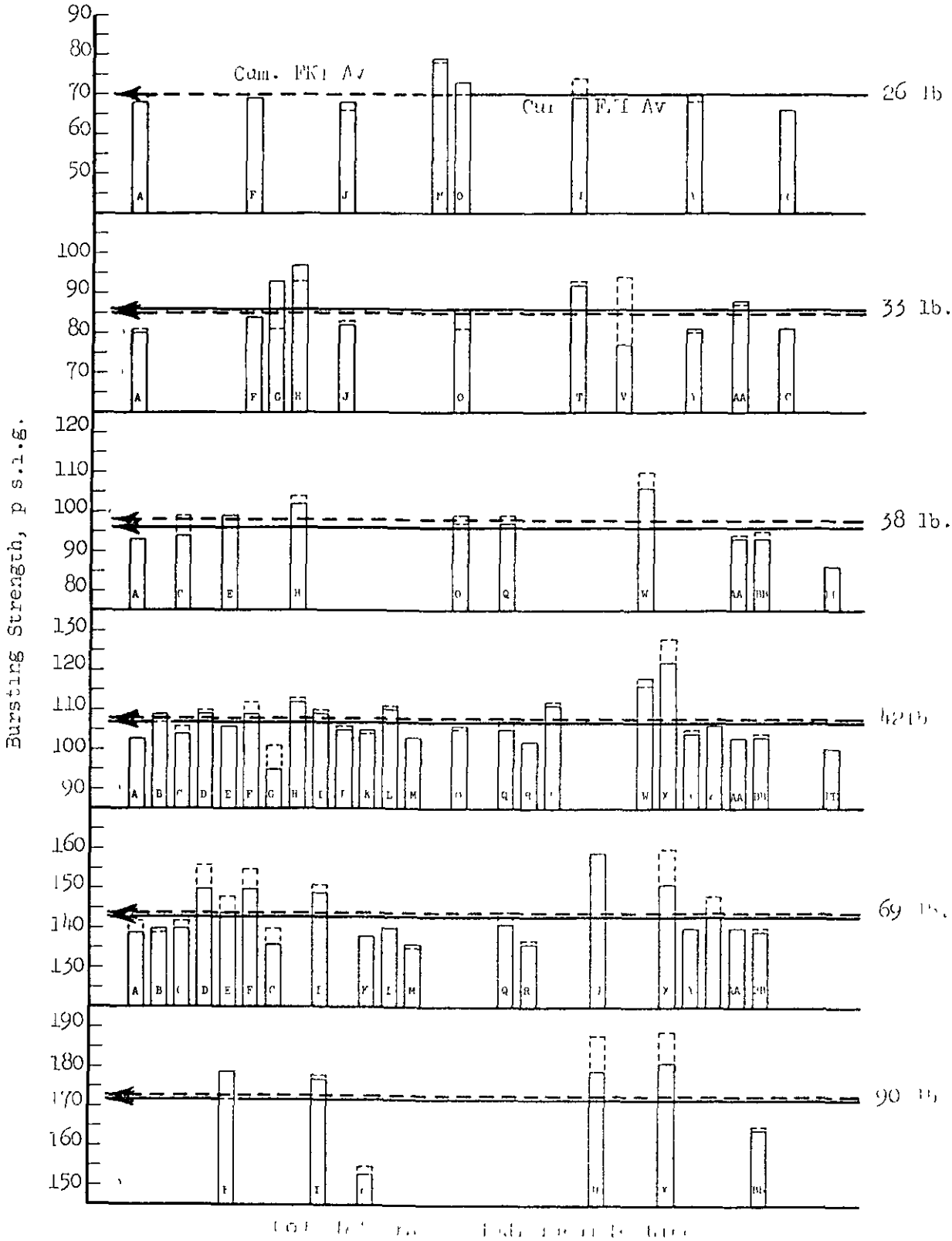
Bursting Strength, p.s.i.g.
Cum. FKI Av
Cum. FKI Av
26 lb
33 lb.
38 lb.
42 lb
69 lb.
90 lb

Figure 2